

CalEEMod Results

C
APPENDIX



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To: Teri Wissler Adam, Senior Principal and Project Manager
From: Sally Rideout EMPA, Principal; Zane Mortensen, Assistant Planner
Cc: File
Date: May 19, 2022

Re: Town of Corte Madera 6th Cycle Housing Element – Greenhouse Gas Emissions Modeling Methodology and Assumptions

Project Description and Setting

This memorandum describes the methodology and assumptions used in the emissions modeling prepared for the 6th cycle update to the Town of Corte Madera Housing Element. The Town of Corte Madera (Town) is updating its Housing Element consistent with the requirements under California State law. Part of the Housing Element update requires that the Town identify adequate housing sites to accommodate its share of Regional Housing Needs Allocation (RHNA). The Town 11 housing sites have been identified. This analysis quantifies operational Greenhouse gas (GHG) emissions that would be generated by the proposed change in land uses that would accommodate the RHNA.

The proposed housing element would change land use designations on 25.11 acres currently improved with 319,425 square feet of retail and commercial development, to a mixed use land use designation that would allow a combination of up to 884 residential units and approximately 264,697 square feet of commercial uses.

Scope of Assessment

The assessment focuses on operational GHG emissions that would result from development consistent with the proposed land use designations. This assessment describes the methodology

and assumptions used to quantify the net change in GHG emissions that would result at buildout of the proposed project using the California Emissions Estimator Model (CalEEMod) version 2020.4 software, a modeling platform recommended by the California Air Resources Board (CARB) and accepted by the air district. The model results will be used to inform the CEQA evaluation of project GHG emissions. Model results are attached to this assessment.

Methodology

Emissions Model

CalEEMod Version 2020.4 software, developed by Breeze Software, was used to estimate the proposed project's operational criteria air pollutant and GHG emissions. The CalEEMod software utilizes emissions models USEPA AP-42 emission factors, CARB vehicle emission models studies and studies commissioned by other California agencies such as the California Energy Commission and CalRecycle. The CalEEMod platform allows calculations of criteria air pollutant and GHG emissions from land use projects.

Data inputs to the model are based on existing and proposed land uses, and their CalEEMod default land uses while utilizing the size metrics provided in Table 2-2 of the proposed Housing Element. Per air district guidance for plan-level analysis, construction emissions are not quantified. The model results are then compared to determine the net change in GHG emissions that would result from development consistent with the proposed housing element land uses. Analysis of site- and project-specific construction and operational emissions of future individual development projects on the opportunity sites may be required as part of the associated future individual project application processes.

Assumptions

Unless otherwise noted, the CalEEMod data inputs are based on or derived from information provided in the proposed housing element. The following primary assumptions were made:

1. The proposed uses would be developed and operational in 2031.
2. Existing and proposed uses are connected to the municipal wastewater system.
3. Trip generation rates are adjusted based on information provided by the transportation engineer (Hexagon Transportation Consultants 2022).

Existing and Proposed Emissions Sources

Existing and proposed land use types and modeled CalEEMod default land use categories are presented in Table 1, Project Characteristics. Development of the proposed land uses would

Table 1 Project Characteristics

Project Land Use Type	CalEEMod Default Land Use ¹	Existing	Proposed
Mixed Use Residential ²	Apartments Low Rise	-	74 Units
	Apartments Mid Rise	-	810 Units
Mixed Use Commercial ³	Strip Mall	58,566 square feet	153,886 square feet
Regional Commercial	Regional Commercial	212,458 square feet	110,811square feet
Commercial	General Office Building	48,401 square feet	-

SOURCE: Breeze Software 2021, Town of Corte Madera 2022.

NOTES:

1. CalEEMod default land use subtype. Descriptions of the model default land use categories and subtypes are found in the User's Guide for CalEEMod Version 2020.4 available online at: <http://www.aqmd.gov/caleemod/user's-guide>
2. Mixed use residential uses consist of apartments and/or townhomes over ground floor commercial uses.
3. Mixed use commercial uses are assumed to include a mix of retail, restaurant, office, and professional services uses on the first floor of buildings.

Model Scenarios

Three modeling scenarios are modeled to estimate the net change in GHG emissions.

Existing Emissions 2021 Scenario

Existing operational GHG emissions are quantified based on the model's default land use emissions factors for the existing uses identified in Table 1 with an operational date of 2021. Site-specific information is not available in detail sufficient to provide a meaningful estimate of existing emissions reductions achieved through compliance with current regulatory measures that reduce emissions. In this scenario, the level of compliance on each opportunity site is unknown and therefore, compliance was not assumed in the model. As a result, the estimate of existing GHG emissions is conservative. Actual GHG emissions volumes are likely lower than reported in this assessment.

Baseline Emissions 2031 Scenario

CalEEMod default emissions factors take into account statewide programs and plans to reduce mobile-source GHG emissions through improved fuel economy and other measures. This scenario is used to capture mobile-source emissions reductions that would be expected due to increased vehicle fuel efficiencies in the future by quantifying emissions for the current mix of land uses at the 2031 buildout horizon. The data inputs are the same as the Existing Emissions 2021 Scenario.

Proposed Unmitigated Emissions 2031 Scenario

The “unmitigated” emissions scenario provides an estimate of operational emissions that would be generated by the proposed land uses in compliance with regulatory measures that reduce emissions. The modeled operational date is 2031. Regulatory compliance consistent with California Pollution Control Officers Association (CAPCOA) emissions reduction measures found in the *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity* are referenced here parenthetically. Compliance with the following regulations is assumed:

- Current Title 24 Residential Building Energy Efficiency Standards (BEES) require 100 percent of electrical energy demand from renewable sources for certain low-rise residential uses including single-family and multi-family residential uses. The model’s operational energy emission factors for energy demand Title 24 and non-Title 24 (plug ins) are adjusted to reflect the BEES for modeled Apartment Low-rise and Single-Family Housing uses;
- State Model Water Efficient Landscape Ordinance (MWELO) (CAPCOA WUW-4);
- Landscaping equipment is set to electric only to reflect phasing out of gas-powered landscaping tools potentially by 2024 (AB 1346). It is assumed that these or similar requirements will be in effect at buildout (CAPCOA A-1); and
- Solid waste diversion of 75 percent is applied consistent with waste diversion targets identified in AB 341. It is assumed that these or similar requirements will be in effect at buildout (CAPCOA SW-1).

Results

Detailed modeling results are attached to this memorandum. GHG emissions are reported in metric tons carbon dioxide equivalent (MT CO_{2e}) per year.

Unmitigated emissions for each CalEEMod source category in the three model scenarios are presented in [Table 2, Existing and Proposed Unmitigated GHG Emissions](#).

Table 2 Existing and Proposed Unmitigated GHG Emissions

Source Category	GHG Emissions (MT CO _{2e})		
	2021 Existing Uses	2031 Baseline Uses	2031 Proposed Uses
Area	<0.01	<0.01	70.24
Energy ³	429.87	429.87	824.42
Mobile	9,495.90	7,192.99	8,632.57
Waste	165.75	165.75	344.27
Water	43.60	43.60	117.71
Total Project Emissions	10,136.13	7,832.22	9,989.22

Source: EMC Planning Group 2022, CalEEMod Results

Note: Results have been rounded, and may; therefore, vary slightly.

Net Unmitigated GHG Emissions at Buildout

When comparing existing uses (2021) to future buildout of the proposed uses (2031), the model results show that emissions generated by current development levels may be greater than the future buildout emissions in 2031. This is expected because the modeled emissions from existing land uses for the year 2021 do not take into account the model's default emissions factors for future fuel efficiencies and related mobile-source emissions reductions that will be achieved through statewide plans and programs. This is demonstrated in the second scenario where emissions from the current mix of land uses are modeled at the 2031 buildout year to provide a baseline. Under this scenario, mobile source emissions are reduced while emissions for all other sources remain constant, which is a much more realistic baseline to compare to the proposed project. The net GHG emissions attributable to the proposed project are derived by comparing the difference between the baseline and proposed levels of development at the 2031

buildout horizon. The net unmitigated GHG emissions are presented in [Table 3, Net Unmitigated Annual GHG Emissions at 2031](#). The proposed project would result in an increase in annual operational GHG emissions of approximately 2,157 MT CO₂e per year.

Table 3 Net Unmitigated Annual GHG Emissions at 2031

Proposed Operational Emissions	Baseline Operational Emissions	Net Project Emissions
9,989.22	7,832.22	2,157

SOURCE: EMC Planning Group 2020

NOTES:

1. Results may vary due to rounding.
2. Expressed in MT CO₂e per year.

Sources

1. Breeze Software, a Division of Trinity Consultants. California Emissions Estimator (CalEEMod) Version 2020.4. May 2021. Available online at: <http://www.aqmd.gov/caleemod/home>
2. ----. 2021. CalEEMod User's Guide (Version 2020.4). May 2021. Available online at: <http://www.aqmd.gov/caleemod/user's-guide>
3. California Air Pollution Control Officers Association. 2010. *Quantifying Greenhouse Gas Mitigation Measures*. Accessed February 15, 2022 at: <http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf>
4. Bay Area Air Quality Management District. May 2017. California Environmental Quality Act Air Quality Guidelines. http://www.baaqmd.gov/~media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en
5. Hexagon Transportation Consultants. May 17, 2022. *Draft Coret Madera Housing Element Update*. San Jose CA.
6. Wolff, Adam, Director of Planning & Building, Town of Corte Madera. Email message to consultant, 29 April 2022.

Corte Madera HE Existing Land Uses GHG Emissions Baseline Year 2031 - Marin County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

**Corte Madera HE Existing Land Uses GHG Emissions - Baseline Year 2031 Operations
Marin County, Annual**

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	48.40	1000sqft	3.16	48,401.00	0
Strip Mall	58.57	1000sqft	5.59	58,566.00	0
Regional Shopping Center	212.46	1000sqft	16.36	212,460.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	69
Climate Zone	5			Operational Year	2031
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	CH4 Intensity (lb/MWhr)	0.033	N2O Intensity (lb/MWhr)	0.004

1.3 User Entered Comments & Non-Default Data

NO CONSTRUCTION

Project Characteristics -

Land Use - Lot Acreage adjusted to match project description.

Vehicle Trips - Weekday Trips adusted per traffic engineer

Water And Wastewater - .

Mobile Land Use Mitigation -

Table Name	Column Name	Default Value	New Value
tblLandUse	LotAcreage	1.11	3.16
tblLandUse	LotAcreage	1.34	5.59
tblLandUse	LotAcreage	4.88	16.36

Corte Madera HE Existing Land Uses GHG Emissions Baseline Year 2031 - Marin County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblVehicleTrips	WD_TR	9.74	10.84
tblVehicleTrips	WD_TR	37.75	67.52
tblVehicleTrips	WD_TR	44.32	54.45
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area			2.9200e-003								0.0000	5.7100e-003	5.7100e-003	1.0000e-005	0.0000	6.0800e-003
Energy			0.0891								0.0000	426.1128	426.1128	0.0525	8.2100e-003	429.8710
Mobile			40.1837								0.0000	7,078.3662	7,078.3662	0.5095	0.3419	7,192.9938
Waste											66.9038	0.0000	66.9038	3.9539	0.0000	165.7513
Water											10.1464	20.0496	30.1960	0.2685	0.0225	43.6007
Total			40.2757								77.0502	7,524.5344	7,601.5846	4.7843	0.3726	7,832.2229

4.0 Operational Detail - Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Corte Madera HE Existing Land Uses GHG Emissions Baseline Year 2031 - Marin County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Category	tons/yr							MT/yr					
Unmitigated			40.1837					0.0000	7,078.3662	7,078.3662	0.5095	0.3419	7,192.9938

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Office Building	524.67	106.97	33.88	943,673	943,673
Regional Shopping Center	14,345.30	9,798.66	4482.91	21,542,620	21,542,620
Strip Mall	3,188.92	2,462.11	1196.50	4,312,799	4,312,799
Total	18,058.88	12,367.74	5,713.29	26,799,092	26,799,092

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11
Strip Mall	9.50	7.30	7.30	16.60	64.40	19.00	45	40	15

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Office Building	0.547817	0.061807	0.196074	0.123406	0.022883	0.005867	0.007115	0.003777	0.000649	0.000372	0.026862	0.000711	0.002661
Regional Shopping Center	0.547817	0.061807	0.196074	0.123406	0.022883	0.005867	0.007115	0.003777	0.000649	0.000372	0.026862	0.000711	0.002661
Strip Mall	0.547817	0.061807	0.196074	0.123406	0.022883	0.005867	0.007115	0.003777	0.000649	0.000372	0.026862	0.000711	0.002661

5.0 Energy Detail

Historical Energy Use: N

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Electricity Unmitigated											0.0000	310.6999	310.6999	0.0503	6.0900e-003	313.7721

Corte Madera HE Existing Land Uses GHG Emissions Baseline Year 2031 - Marin County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

NaturalGas Unmitigated	0.0891	0.0000	115.4130	115.4130	2.2100e-003	2.1200e-003	116.0988
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5.2 Energy by Land Use - NaturalGas

Unmitigated

Land Use	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	kBTU/yr	tons/yr										MT/yr					
General Office Building	926879			0.0382								0.0000	49.4618	49.4618	9.5000e-004	9.1000e-004	49.7557
Regional Shopping Center	968818			0.0399								0.0000	51.6998	51.6998	9.9000e-004	9.5000e-004	52.0070
Strip Mall	267061			0.0110								0.0000	14.2514	14.2514	2.7000e-004	2.6000e-004	14.3361
Total				0.0891								0.0000	115.4130	115.4130	2.2100e-003	2.1200e-003	116.0988

5.3 Energy by Land Use - Electricity

Unmitigated

Land Use	Electricity Use	Total CO2	CH4	N2O	CO2e
	kWh/yr	MT/yr			
General Office Building	582748	53.9181	8.7200e-003	1.0600e-003	54.4512
Regional Shopping Center	2.17559e+006	201.2938	0.0326	3.9500e-003	203.2843
Strip Mall	599716	55.4880	8.9800e-003	1.0900e-003	56.0367
Total		310.6999	0.0503	6.1000e-003	313.7721

6.0 Area Detail

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Unmitigated			2.9200e-003								0.0000	5.7100e-003	5.7100e-003	1.0000e-005	0.0000	6.0800e-003

Corte Madera HE Existing Land Uses GHG Emissions Baseline Year 2031 - Marin County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping			2.9200e-003								0.0000	5.7100e-003	5.7100e-003	1.0000e-005	0.0000	6.0800e-003
Total			2.9200e-003								0.0000	5.7100e-003	5.7100e-003	1.0000e-005	0.0000	6.0800e-003
	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

7.0 Water Detail

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Unmitigated	30.1960	0.2685	0.0225	43.6007

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Office Building	8.60231 / 5.27239	9.0576	0.0805	6.7400e-003	13.0785
Regional Shopping Center	15.7374 / 9.64553	16.5704	0.1473	0.0123	23.9263
Strip Mall	4.33843 / 2.65904	4.5680	0.0406	3.4000e-003	6.5959
Total		30.1960	0.2685	0.0225	43.6007

Corte Madera HE Existing Land Uses GHG Emissions Baseline Year 2031 - Marin County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

8.0 Waste Detail

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Unmitigated	66.9038	3.9539	0.0000	165.7513

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Office Building	45.01	9.1366	0.5400	0.0000	22.6356
Regional Shopping Center	223.08	45.2832	2.6762	0.0000	112.1873
Strip Mall	61.5	12.4839	0.7378	0.0000	30.9284
Total		66.9038	3.9539	0.0000	165.7513

Corte Madera Housing Element- Proposed Unmitigated Emissions - Marin County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

**Corte Madera Housing Element- Proposed Unmitigated Emissions
Marin County, Annual**

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Low Rise	74.00	Dwelling Unit	5.35	74,000.00	183
Apartments Mid Rise	810.00	Dwelling Unit	14.06	810,000.00	2001
Strip Mall	153.90	1000sqft	0.00	153,900.00	0
Regional Shopping Center	110.80	1000sqft	5.70	110,800.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	69
Climate Zone	5			Operational Year	2031
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MW hr)	203.98	CH4 Intensity (lb/MW hr)	0.033	N2O Intensity (lb/MW hr)	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -
 Land Use - Population adjusted per DOF update 2.47 pph.
 Mixed used residential over commercial acreage adjusted to match project description.
 Vehicle Trips - Weekday Trips Adjusted per TIA
 Energy Use - Residential low to mid rise elec from renewable sources.
 Water And Wastewater - No septic systems.
 Area Mitigation - Air district woodburn prohibition
 AB-1346 2-stroke engines
 Water Mitigation - Compliance with MWEL0
 Waste Mitigation - Compliance with AB-341.

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True

Corte Madera Housing Element- Proposed Unmitigated Emissions - Marin County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblEnergyUse	NT24E	3,172.76	0.00
tblEnergyUse	NT24E	3,054.10	0.00
tblEnergyUse	T24E	49.64	0.00
tblEnergyUse	T24E	90.83	0.00
tblLandUse	LotAcreage	4.63	5.35
tblLandUse	LotAcreage	21.32	14.06
tblLandUse	LotAcreage	3.53	0.00
tblLandUse	LotAcreage	2.54	5.70
tblLandUse	Population	212.00	183.00
tblLandUse	Population	2,317.00	2,001.00
tblVehicleTrips	WD_TR	7.32	6.74
tblVehicleTrips	WD_TR	5.44	4.54
tblVehicleTrips	WD_TR	44.32	54.45
tblVehicleTrips	WD_TR	37.75	67.52
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

2.2 Overall Operational

Unmitigated Operational

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Area	5.3541	0.0905	4.9886	4.2000e-004		0.0296	0.0296		0.0296	0.0296	0.0000	42.8197	42.8197	6.0300e-003	6.5000e-004	43.1635

Corte Madera Housing Element- Proposed Unmitigated Emissions - Marin County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Energy	0.0512	0.4408	0.2121	2.7900e-003		0.0354	0.0354		0.0354	0.0354	0.0000	818.3286	818.3286	0.0602	0.0154	824.4222
Mobile	5.4769	4.6022	47.7448	0.0922	11.8136	0.0588	11.8724	3.1539	0.0547	3.2086	0.0000	8,496.5122	8,496.5122	0.6030	0.4060	8,632.5744
Waste						0.0000	0.0000		0.0000	0.0000	34.7404	0.0000	34.7404	2.0531	0.0000	86.0678
Water						0.0000	0.0000		0.0000	0.0000	21.8517	45.6167	67.4683	0.5786	0.0484	96.3613
Total	10.8821	5.1336	52.9454	0.0954	11.8136	0.1238	11.9374	3.1539	0.1197	3.2736	56.5921	9,403.2773	9,459.8693	3.3009	0.4705	9,682.5892

4.0 Operational Detail - Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	5.4769	4.6022	47.7448	0.0922	11.8136	0.0588	11.8724	3.1539	0.0547	3.2086	0.0000	8,496.5122	8,496.5122	0.6030	0.4060	8,632.5744
Unmitigated	5.4769	4.6022	47.7448	0.0922	11.8136	0.0588	11.8724	3.1539	0.0547	3.2086	0.0000	8,496.5122	8,496.5122	0.6030	0.4060	8,632.5744

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	498.76	602.36	464.72	1,174,891	1,174,891
Apartments Mid Rise	3,677.40	3,977.10	3312.90	8,471,970	8,471,970
Strip Mall	8,379.86	6,469.96	3144.18	11,333,193	11,333,193
Regional Shopping Center	7,481.22	5,110.10	2337.88	11,234,690	11,234,690
Total	20,037.23	16,159.51	9,259.68	32,214,743	32,214,743

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Apartments Mid Rise	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Strip Mall	9.50	7.30	7.30	16.60	64.40	19.00	45	40	15
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Apartments Low Rise	0.547817	0.061807	0.196074	0.123406	0.022883	0.005867	0.007115	0.003777	0.000649	0.000372	0.026862	0.000711	0.002661
Apartments Mid Rise	0.547817	0.061807	0.196074	0.123406	0.022883	0.005867	0.007115	0.003777	0.000649	0.000372	0.026862	0.000711	0.002661
Strip Mall	0.547817	0.061807	0.196074	0.123406	0.022883	0.005867	0.007115	0.003777	0.000649	0.000372	0.026862	0.000711	0.002661
Regional Shopping Center	0.547817	0.061807	0.196074	0.123406	0.022883	0.005867	0.007115	0.003777	0.000649	0.000372	0.026862	0.000711	0.002661

5.0 Energy Detail

Historical Energy Use: N

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	311.9033	311.9033	0.0505	6.1200e-003	314.9875
NaturalGas Unmitigated	0.0512	0.4408	0.2121	2.7900e-003		0.0354	0.0354		0.0354	0.0354	0.0000	506.4254	506.4254	9.7100e-003	9.2800e-003	509.4348

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	1.44418e+006	7.7900e-003	0.0666	0.0283	4.2000e-004		5.3800e-003	5.3800e-003		5.3800e-003	5.3800e-003	0.0000	77.0671	77.0671	1.4800e-003	1.4100e-003	77.5251
Apartments Mid Rise	6.83884e+006	0.0369	0.3151	0.1341	2.0100e-003		0.0255	0.0255		0.0255	0.0255	0.0000	364.9464	364.9464	6.9900e-003	6.6900e-003	367.1151
Regional Shopping Center	505248	2.7200e-003	0.0248	0.0208	1.5000e-004		1.8800e-003	1.8800e-003		1.8800e-003	1.8800e-003	0.0000	26.9620	26.9620	5.2000e-004	4.9000e-004	27.1222
Strip Mall	701784	3.7800e-003	0.0344	0.0289	2.1000e-004		2.6100e-003	2.6100e-003		2.6100e-003	2.6100e-003	0.0000	37.4499	37.4499	7.2000e-004	6.9000e-004	37.6724
Total		0.0512	0.4408	0.2121	2.7900e-003		0.0354	0.0354		0.0354	0.0354	0.0000	506.4254	506.4254	9.7100e-003	9.2800e-003	509.4348

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	59966.6	5.5483	9.0000e-004	1.1000e-004	5.6032

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Apartments Mid Rise	600566	55.5667	8.9900e-003	1.0900e-003	56.1161
Regional Shopping Center	1.13459e+006	104.9767	0.0170	2.0600e-003	106.0148
Strip Mall	1.57594e+006	145.8115	0.0236	2.8600e-003	147.2534
Total		311.9033	0.0505	6.1200e-003	314.9874

6.0 Area Detail

6.1 Regulatory Compliance - Area

- Use Electric Lawnmower
- Use Electric Leafblower
- Use Electric Chainsaw
- Use Low VOC Paint - Residential Interior
- Use Low VOC Paint - Residential Exterior
- Use Low VOC Paint - Non-Residential Interior
- Use Low VOC Paint - Non-Residential Exterior
- Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Unmitigated	5.3541	0.0905	4.9886	4.2000e-004		0.0296	0.0296		0.0296	0.0296	0.0000	42.8197	42.8197	6.0300e-003	6.5000e-004	43.1635

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.7603					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	4.4863					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	3.5700e-003	0.0305	0.0130	1.9000e-004		2.4700e-003	2.4700e-003		2.4700e-003	2.4700e-003	0.0000	35.3145	35.3145	6.8000e-004	6.5000e-004	35.5244

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Landscaping	0.1040	0.0601	4.9756	2.3000e-004		0.0272	0.0272		0.0272	0.0272	0.0000	7.5052	7.5052	5.3500e-003	0.0000	7.6391
Total	5.3541	0.0905	4.9886	4.2000e-004		0.0296	0.0296		0.0296	0.0296	0.0000	42.8197	42.8197	6.0300e-003	6.5000e-004	43.1635

7.0 Water Detail

7.1 Regulatory Compliance - Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	67.4683	0.5786	0.0484	96.3613
Unmitigated	81.6162	0.7228	0.0605	117.7055

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	3.85712 / 2.85416	4.2200	0.0361	3.0200e-003	6.0244
Apartments Mid Rise	42.2198 / 31.2415	46.1917	0.3955	0.0331	65.9431
Regional Shopping Center	6.56579 / 4.7234	7.1397	0.0615	5.1500e-003	10.2109
Strip Mall	9.11981 / 6.56075	9.9170	0.0854	7.1500e-003	14.1829
Total		67.4684	0.5786	0.0484	96.3613

8.0 Waste Detail

8.1 Regulatory Compliance - Waste

Corte Madera Housing Element- Proposed Unmitigated Emissions - Marin County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Institute Recycling and Composting Services

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Unmitigated	34.7404	2.0531	0.0000	86.0678

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	8.51	1.7275	0.1021	0.0000	4.2797
Apartments Mid Rise	93.15	18.9086	1.1175	0.0000	46.8453
Regional Shopping Center	29.085	5.9040	0.3489	0.0000	14.6269
Strip Mall	40.3975	8.2003	0.4846	0.0000	20.3160
Total		34.7404	2.0531	0.0000	86.0678

